

Abstract for AGU Fall Meeting (Dec 1999)

Title: Measurements of the OH Column Using a Fourier Transform Spectrometer at the JPL Table Mountain Facility

Suggested Session: HOx Dilemmas in the Middle Atmosphere (contributed)
Conveners: Michael Stevens (NRL), Ken Jucks (CfA)

Preferred Medium: Oral

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A compact, high resolution Fourier-transform spectrometer for atmospheric near ultraviolet spectroscopy has been installed at the Jet Propulsion Laboratory's Table Mountain Facility (34.4 N, 117.7 W, elevation 2290m). This instrument is designed with an unapodized resolving power near 500,000 at 300 nm to provide high resolution spectra from 290 to 675 nm for the quantification of, in particular, terrestrial OH column abundances.

The data record for OH column diurnal measurements begins in August 1997 and regular observations are ongoing. The measurement technique employs spectral analysis of terrestrial absorptions of direct solar radiation. Fifteen minute integrated observations of the east and west solar limbs are used. These spectra, which display a relative frequency shift of about 0.3cm^{-1} due to the 27 day solar rotation period, are shifted and ratioed to enhance discrimination between solar Fraunhofer and telluric OH absorption features. Seven atmospheric OH absorption lines can be observed using this method.

Measured OH column abundance uncertainties are derived from published OH transition cross sections and time constant uncertainties, as well as from the measurement analytical technique. The latter involves constructing a chi-squared hyper-surface by varying measurement technique affected parameters in the analysis routines to produce the best match to the observed absorption features with the modeled absorption spectrum.